

NO <sub>2</sub> in N <sub>2</sub>	-	-	-	-	-	-	-	-24
NO <sub>2</sub> in 2% O <sub>2</sub> /98% N <sub>2</sub>	-6.1	6	6	-	-	-	-	-18
CO in N <sub>2</sub>	18.1	-6	-12.1	-3	-6	72.5	28.5	18
N <sub>2</sub>	18.1	-3	-	-	-6	-	18.1	21

	ZnO + 10% F3876	SnO <sub>2</sub> + 5% F2889	WO <sub>3</sub> + 10% F3876	CuFe <sub>2</sub> O <sub>4</sub>	Zn <sub>4</sub> TiO <sub>6</sub>	ZnTiO <sub>3</sub>	Tm <sub>2</sub> O <sub>3</sub>	Yb <sub>2</sub> O <sub>3</sub>
NO <sub>2</sub> in N <sub>2</sub>	-42	-6	-15	-6	-12	-6	-6	-6
NO <sub>2</sub> in 2% O <sub>2</sub> /98% N <sub>2</sub>	-24	-6	-18	-6	-	-	-	-
CO in N <sub>2</sub>	12	24	6	-	6	-	-	-
N <sub>2</sub>	27	9	18	-	6	-	-	-

	Fe:ZrO <sub>2</sub>	MnCrO <sub>3</sub>
NO <sub>2</sub> in N <sub>2</sub>	-6	-
NO <sub>2</sub> in 2% O <sub>2</sub> /98% N <sub>2</sub>	-	-
CO in N <sub>2</sub>	6	24
N <sub>2</sub>	-	-

- All of the measurements were obtained using 10 V, except that BaCuO<sub>2.5</sub> was measured with 4 V; Fe<sub>2</sub>O<sub>3</sub> was measured with 1 V; ZnO + 2.5% F2889, ZnO + 10% F3876, SnO<sub>2</sub> + 5% F2889, Tm<sub>2</sub>O<sub>3</sub>, Yb<sub>2</sub>O<sub>3</sub>, Fe:ZrO<sub>2</sub> and MnCrO<sub>3</sub> were measured with 5 V; WO<sub>3</sub> + 10% F3876 was measured with 2 V; CuFe<sub>2</sub>O<sub>4</sub> was measured with 6 V; and Zn<sub>4</sub>TiO<sub>6</sub> and ZnTiO<sub>3</sub> were measured using 20 V.

#### Example 4

- This example illustrates that a set of 4 metal oxide materials of Example 3 could be used to differentiate the 4 gas compositions shown at 600°C using the IR thermographic signals. The results are shown in Table 4 below. The signals are measurements of the differences in temperature (°C) of the materials when exposed to the gases shown relative to that in a

comparison gas which is 2% O<sub>2</sub>/ 98% N<sub>2</sub>. All of the signals were generated with 10 V across the materials, unless otherwise specified. Blank spaces indicate that there was no detectable signal when that gas composition was contacted with that material. Unless otherwise specified, the gases were measured at 2000 ppm in N<sub>2</sub>.

Table 4  
Change in temperature in °C

	SrTiO <sub>3</sub>	Cu <sub>2</sub> O	Fe <sub>2</sub> O <sub>3</sub>	SrNb <sub>2</sub> O <sub>6</sub>
NO <sub>2</sub> in N <sub>2</sub>	3	-	-	-
NO <sub>2</sub> in 2% O <sub>2</sub> / 98% N <sub>2</sub>	6	6	-	-
CO in N <sub>2</sub>	-	-12.1	72.5	28.5
N <sub>2</sub>	-	-	-	18.1

#### Example 5

This example demonstrates that this second set of 4 metal oxide materials of Example 3 could be used to differentiate the 4 gas compositions shown at 600°C using the IR thermographic signals. The results are shown in Table 5 below. The signals are measurements of the differences in temperature (°C) of the materials when exposed to the gases shown relative to that in a comparison gas which is 2% O<sub>2</sub>/ 98% N<sub>2</sub>. All of the signals were generated with 10 V across the materials, unless otherwise specified. Blank spaces indicate that there was no detectable signal when that gas composition was contacted with that material. Unless otherwise specified, the gases were measured at 2000 ppm in N<sub>2</sub>.

Table 5  
Change in temperature in °C

	ZnO	AlVO <sub>4</sub>	LaFeO <sub>3</sub>	BaCuO <sub>2.5</sub>
NO <sub>2</sub> in N <sub>2</sub>	-54.4	-	-	-
NO <sub>2</sub> in 2% O <sub>2</sub> / 98%	-48.3	-6.1	-	-

N <sub>2</sub>				
CO in N <sub>2</sub>	28.5	18.1	-3	-6
N <sub>2</sub>	30.2	18.1	-	-6

#### Comparative Example A

This comparative example demonstrates that this set of 6 materials of Example 3 can not be used to differentiate the 2 gas compositions at 600°C using the IR thermographic signals, and illustrates the importance of the proper selection of materials. The results are shown in Table 5A below. The signals are measurements of the differences in temperature (°C) of the materials when exposed to the gas compositions shown relative to that in a comparison gas which is 2% O<sub>2</sub>/ 98% N<sub>2</sub>. All of the signals were generated with 10 V across the materials, unless otherwise specified. Blank spaces indicate that there was no detectable signal when that gas composition was contacted with that material. Unless otherwise specified, the gases were measured at 2000 ppm in N<sub>2</sub>.

Table 5a  
Change in temperature in °C

	SnO <sub>2</sub>	WO <sub>3</sub>	FeTiO <sub>3</sub>	Ni O	SnO <sub>2</sub> + 5% F2889	CuFe <sub>2</sub> O <sub>4</sub>
NO <sub>2</sub> in N <sub>2</sub>	-48.3	-18.1	-6.1	6	-6	-6
NO <sub>2</sub> in 2% O <sub>2</sub> / 98% N <sub>2</sub>	-48.3	-18.1	-6.1	6	-6	-6

#### Comparative Example B

This comparative example demonstrates that this set of 3 materials can not be used to differentiate the 2 gas compositions at 600°C using the IR thermographic signals, and illustrates the importance of the proper selection of materials. The results are shown in Table 5B below. The signals are measurements of the differences in temperature (°C) of the materials when exposed to the gas compositions shown relative to that